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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/327,347	06/05/1999	JAMALODDIN S. GOLESTANI	GOLESTANI.3	5312

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EXAMINER
LE, HIEU C

ART UNIT	PAPER NUMBER
2153	

DATE MAILED: 01/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/327,347	GOLESTANI, JAMALODDIN S.	
	Examiner	Art Unit	
	Hieu c. Le	2153	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,12,14,15,21,23,25-27,31 and 34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *9-11,13,16-20,22,24,28,29,33,35 and 36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 U.S.C. § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 34 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 34 recites the limitation "said at least one congestion field of a received probe packet " in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 U.S.C. § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 5-8,23,25-27, 31-32 &34 are rejected under 35 U.S.C. 102(b) as anticipated by Afek et al (US.Pat.No.5,748,901).

As to claim 1, Afek discloses in a network that carries traffic of a plurality of sessions, a method, carried out by one of said sessions, comprising the steps of:

evaluating a session congestion measure that is related to congestion information on links of said network which carry incoming traffic to a receiving end of said session [a TCP/IP header includes a selective set of explicit forward congestion indication bit (col. 11, lines 6-10)];

evaluating a session incremental reward function that is related to rate of said incoming traffic [Fair share parameter (MACR) is computed for each session (col. 7; lines 63-65) which is related the flow rate of the session (col. 8, lines 7-14)].

evaluating a new rate of said incoming traffic that moves said rate of said to incoming traffic in a direction that minimizes a global network cost function which combines cost functions assigned to said sessions and congestion cost functions assigned to said links [new flow rates are calculate to minimize the changes in MACR (cost functions assigned to said sessions) and changes in link utilization (congestion cost functions assigned to links) (col. 8, line 25-col. 9, lines 19)].

As to claim 5, Afek further discloses where said new rate is an incremental change from said rate of said incoming traffic of said session, where the incrementing is determined based on said session incremental reward function and said session congestion measure [the change in the rate of flow of traffic is updated in increments of Δ (col. 10, lines 7-45)].

As to claim 6, Afek further discloses where said step of evaluating a new rate is carried out at a receiving end of said session, and said method further comprises a step of communicating information to a sending end of said session, to change said rate of said incoming traffic towards

said new rate [the evaluation of the new rate of flow is carried in router (receiving end) and the source (sending end) periodically polls the router (receiving end) to receive the new rate and adjust it's window (col. 10, line 46-54)].

As to claim 7, Afek further discloses where said step of evaluating a new rate is carried out at a sending end of said session and includes a step of receiving at said sending end results of said step of evaluating said session congestion measure [the new rate is implemented in the source (sending end) after it receives a backward packet with a TCP/IP header includes the current rate and the source adjust it's window size (col. 10, lines 55-65)].

As to claim 8, Afek further discloses where said new rate developed is an incremental change arrived at through an additive factor [the new rate is an average of Δ i.e (incremental change of additive factor) (col. 10, lines 9-10)].

As to claim 23, Afek further discloses where said incoming traffic comprises packets where some of said packets traverse one subset of links of said network, and at least some others of said packets traverse a different subset of links [incoming tracks comprises packets (col. 10, lines 63-65), and the packets are transmitted via at least a first & 2nd links (col. 12, lines 7-13).

As to claim 25, Afek further discloses where said incoming traffic originates at a sending end, and said sending end includes in said incoming traffic probe packets that include at least one congestion field that is modified by network nodes through which said probe packets traverse [the router sends a backward packet (probe packet) to the source (col. 10, lines 63-65).

The packet includes a Explicit Forward Congestion indication bit (ones congestion field) (col. 11, lines 6-11)].

As to claim 26, Afek further discloses where said probe packets are transmitted by to said sending end at regular intervals [the packets are sent periodically by the router (col. 10, lines 48-54)].

As to claim 27, Afek further discloses where said probe packets also carry information for said receiving end [the backward packets (probe packets) indicate the current rate to the source (receiving end of the packet) (col. 10, lines 55-59)].

As to claim 31, Afek further discloses where information received at said receiving end of said session from said second one of said congestion fields is employed to control said rate of said incoming traffic (col. 11, lines 6-15).

As to claim 32, Afek further discloses where said step of evaluating said session congestion measure employs information contained in said at least one congestion field of probe packets received in said incoming traffic and in said second one of said congestion fields (col. 10, lines 66-col. 11, line 10)

As to claim 34, (as best understood by the Examiner) Afek further discloses where said step of evaluating said session congestion measure equates said session congestion measure to the value of said at least one congestion field of a received probe packet (col. 11, lines 37-42).

Claim Rejections - 35 U.S.C. § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 2-4,21, 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Afek et al (US.Pat.No.5,748,901), as applied to claim 1 above, and further in view of Mitra et al (US.Pat.No. 6,331,986).

As to claim 2, Afek does not discloses where said session incremental reward function is the negative of a derivative, with respect to rate of said incoming traffic, of said one of said cost functions assigned to said session.

Mitra discloses a method for optimizing routing and bandwidth allocation in a network by determining a traffic rate to be offered to each of permissible routes between a source and destination (Abstract). A revenue sensitivity to link capacity (a session incremental reward function) is calculated with respect to as shown in col. 17, equation 15.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Mitra's teachings to modify Afek's method by using a negative derivative session incremental reward function of the incoming traffic rate [in order to allocate a respective bandwidth to each link and determine the traffic rate to be offered.

As to claim 3, Afek does not disclose where said session congestion measure is a derivative, with respect to said rate of said incoming traffic, of a sum of congestion cost functions assigned to links employed by said session.

Mitra discloses a method for optimizing routing and bandwidth allocation in a network by determining a traffic rate to be offered to each of permissible routes between a source and destination (Abstract). A network implied cost (a session congestion measure) that implies the cost for the traffic routing based on capacity costs the function is a derivative and is the sum of the capacity costs (congestion costs) of the link as shown in col. 15, equation 3.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Mitra's teachings to modify Afek's method by using a derivative session congestion measure of the sum of congestion cost functions of the links in order to allocate a respective bandwidth to each link and determine the traffic rate to be offered.

As to claim 4, Afek does not disclose where said congestion cost function assigned to a link is very large for link loads in excess of a selected threshold, chosen as maximum permissible link load.

Mitra discloses a method for optimizing routing and bandwidth allocation in a network by determining a traffic rate to be offered to each of permissible routes between a source and destination (Abstract). Mitra discloses that the implied costs (congestion cost function) reflect the effective lost of revenue associated with carrying calls (sessions) on a given link reduces the remaining capacity of the link (col. 6, lines 35-42). The link capacities may become so great (col.

6, lines 38-39). A threshold is used to limit the upper bound of the link capacity increment (col. 12, lines 24-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Mitra's teachings to modify Afek's method by using a threshold to limit the upper bound of loads on a link when the congestion cost function assigned to link is very larger in order to allocate a respective bandwidth to each link and determine the traffic rate to be offered.

As to claim 21, Afek does not disclose where said incoming traffic comprises packets, and all packets of said incoming traffic of said session traverse the same path that includes a given subset of links of said network.

Mitra discloses a method for optimizing routing and bandwidth allocation in a network by determining a traffic rate to be offered to each of permissible routes between a source and destination (Abstract). The incoming traffic traverse the same path that includes a given subset of links in the network (col. 7, lines 42-60, Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Mitra's teachings to modify Afek's method by using a network where all the incoming traffic of the session traverse the same path in order to allocate a respective bandwidth to each link and determine the traffic rate to be offered.

As to claim 35, Afek does not disclose where said step of evaluating said session congestion measure is based on probability of packet loss experienced at said receiving end.

Mitra discloses a method for optimizing routing and bandwidth allocation in a network by determining a traffic rate to be offered to each of permissible routes between a source and destination (Abstract). Calculating the link loss probabilities (col. 7, lines 30-32, col. 11, lines 53-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Mitra's teachings to modify Afek's method by calculating the loss probabilities of the link in order to allocate a respective bandwidth to each link and determine the traffic rate to be offered.

7. Claims 12, 14 -15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Afek et al (US.Pat.No.5,748,901), as applied to claim 1 above, and further in view of Szentesi (US.Pat.No. 5,844,886).

As to claims 12, 14-15, Afek does not disclose where said session incremental reward function 5 is a positive, decreasing, function with respect to session rate, and where a derivative of each of said link cost functions is a positive, increasing function with respect to rate of traffic on the link.

Szentesi discloses an efficient method for management of traffic overloads on a network. As shown in Fig. 3, the session incremental reward function (the curve represents the relation of traffic flow and revenue) is a positive decreasing function. As shown in fig. 9, the link cost function (the curve represent the represents the relation of optimal load (or traffic volume) and revenue is a positive increasing function).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Mitra's teachings to modify Afek's method by using a positive decreasing session incremental reward function and a positive increasing link cost function in order to provide additional revenue gains over conventional traffice management method.

Allowable Subject Matter

8. Claims 9- 11, 13, 16-20, 22, 24, 28-30, 33, 35-36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hieu Le whose telephone number is (703) 306-3101. The examiner can normally be reached on Monday to Friday from 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton Burgess, can be reached on (703) 305-4752. The fax phone number for this Group is (703) 308-9051.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Hieu Le

Dung C. Dinh
Primary Examiner